

A REVISION OF THE GENUS *BASILARCHIA* (*Rhopalocera*: *Nymphalidae*).

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This study arose as an examination of the male genitalia of *Basilarchia arthemis* and *B. astyanax* in an effort to determine if constant structural differences exist between these two so-called species. Incidentally, observations have been extended to all the known species and subspecies of the genus *Basilarchia*. Color forms and aberrations have not been studied genitally, but they are listed in this paper merely for the sake of completeness. Only that part of bibliography which may prove of interest is given.

For the study of the evolution of "species," the genus *Basilarchia* furnishes an excellent material. I refer especially to the phylogenetic relationship of our common *arthemis*, *astyanax* and *archippus*. These three forms apparently have evolved from a common parent stock rather recently, as might be judged from the occurrence of intermediate forms, yet, there are reasons to believe, as it will be developed later in this paper, that *archippus* has already become a separate species, while the remaining two have not yet reached that degree of segregation which is worthy of specific distinction. The logical treatment of these forms, representing as they do various degrees of phylogenetic affinity, presents an interesting problem in philosophical taxonomy.

I am greatly indebted in this study to Dr. William Barnes, of Decatur, Ill., for a magnificent gift of specimens. I am under deep obligation to M. Charles Oberthür, of Rennes, France, for his kindness in comparing my specimens with Boisduval's types of *B. lorquini*. My thanks are also due to Messrs. Jacob Doll and George Engelhardt, of the Brooklyn Museum, New York, and to Mr. Frank E. Watson, of the American Museum of Natural History, New York, for certain biological data and for information on larvae of our Northeastern species; to Mr. D. M. Bates, of the Agricultural Experiment Station, Gainesville, Fla., for a series of *B. archippus floridensis*; to Captain N. D. Riley, of the British Museum, for information concerning Drury's and Fabricius's types. Finally, I express my lasting appreciation to Mr. Foster H. Benjamin, of the Barnes Collection, Decatur, Ill., for his constant encouragement, friendly advice and help, without which the completion of this work would have been impossible.

Genus BASILARCHIA Scudder.

Callianira Hübner, Verz. Bek. Schmett., p. 38, 1818 (preoccupied in Mollusca). Sole species and therefore type: *C. ephestiaena* Hbn.

Basilarchia Scudder, Fourth Rep. Peab. Acad. Sci., p. 29, 1872. Type: *Callianira ephestiaena* Hbn.

Without going into finer anatomical details, it may be said that all the species of the genus agree very closely as to the appearance of the penis. This organ tapers very gradually into a more or less dull point, and is covered with evenly distributed, minute spines. The spines become smaller and more like hairs toward the base of the penis. The uncus likewise offers little assistance in distinguishing species, for the differences that can be detected in this organ are very slight and comparative. Generally speaking, the uncus very gradually tapers into a sharp point in *arthemis*, *weidemeyerii*, and *lorquini*. In *archippus* and *obsoleta*, however, the uncus appears in the lateral view to be slightly constricted near the base and gradually dilated again before ending in a sharp point.

All the species can be most readily recognized by the structure of the valve, as follows:

KEY TO THE SPECIES OF BASILARCHIA.

- A. The apex of the valve not produced into a conspicuous prolongation.
 - a. The distal portion of valve narrow and the apex almost subacute *arthemis*.
 - b. The distal portion of valve very broad and the apex very full and rounded *weidemeyerii*.
- B. The apex of the valve produced into a conspicuous prolongation.
 - a. The prolongation straight, very slender and sharply pointed: needle-like *lorquini*.
 - b. The prolongation straight, thick and blunt *obsoleta*.
 - c. The prolongation strongly hooked *archippus*.

***Basilarchia arthemis arthemis* (Drury). (Fig. 1.)**

Nym. Phal. arthemis Dru., Ill. Exot. Ent., vol. II, pl. X, fig. 3, 1773.

Limenitis arthemis Edwards, Butt. N. Amer., vol. II, p. 202, pl. XXXVI, fig. 1-4, 1879.

Basilarchia arthemis Scudder, Butt. East. U. S., vol. I, p. 294, pl. II, fig. 5, 1879; Holland, Butt. Book, p. 184, pl. XXII, fig. 4, 1898; Field, Psyche, vol. XI, p. I, pl. I, fig. 5; pl. II, fig. 4, 1904; Barnes and McDunnough, Cont. Nat. Hist. Lepid. N. Amer., vol. III, p. 101, 1916.

Papilio lamina Fabricius, Ent. Syst., vol. III, p. 118, 1793.

Genitally, *B. arthemis* can be told by the relatively slender distal portion of the valve furnished with spiny projections, some seven in number, of intergrading lengths. Viewed from the side, these projections are distributed somewhat evenly over the entire margin of the terminal portion of the valve. The typical race of the species, subsp. *artemis*, is characterized by the fact that the dorsal margin of the valve, at about the middle, curves sharply downward toward the apex. This is a small sized northern race, occurring as far south as the mountainous sections of central New York.

There is a possibility that the true *artemis* and *albofasciata* are one and the same race, but without an accurate comparison of the types it is not possible to arrive at a logical conclusion. Drury's *artemis* was described as having been received from New York, which at that time most likely meant the vicinity of New York City. It may be recalled that New York State was then a wilderness, with the exception of Dutch colonies along the Hudson. This consideration favors the idea that *albofasciata* may be a straight synonym of *artemis*, in which case the smaller race inhabiting northern territories now called *artemis* would prove to be nameless. However, Drury's specimens might have come from the Catskills, and really represented the northern race. Drury gives the expanse of female as $2\frac{5}{8}$ inches. Since this measurement was most likely taken from a specimen spread in "English" fashion, it might be considered to point to the northern race. He also notes the series of "brown orange spots" to the upperside of hindwing. This character is much more constantly found in the northern race than in *albofasciata*.

Captain N. D. Riley, of the British Museum, has kindly informed me that "Drury's collection was sold at auction after his death and it is quite impossible now to trace his specimens."

Fabricius's *lamina* is tentatively listed as a synonym of *artemis*, although it is quite possible that it may be the same as *albofasciata* and take priority over the latter. *Lamina* was inadequately described from a specimen in Jones Collection, of which it is stated that "habitat in Indiis." In spite of the fact that

Butler mentions this name in his "Cat. Diurn. Lepid. described by Fabricius in the coll. of British Museum," the type of *lamina* is not to be found in the Museum (Capt. N. D. Riley).

Aberr. **rufescens** (Cockerell).

Limenitis arthemis f. *rufescens* Ckll., Ent. vol. XXII, p. 4, 1889.

This aberration is unknown to me, and also probably to its describer, being simply a name given to the form mentioned by Maynard (Butt. New England, p. 11, 1886): "occasionally the ground color is reddish brown even above."

Aberr. **arthechippus** Scudder.

Basilarchia arthemis-archippus hyb. *arthechippus* Scud., Butt. East. U. S., I, p. 296, 1889.

I tentatively place this as an aberration of *arthemis* in absence of proof that it is a hybrid. This might be a form parallel to aberr. *rubidus* Stkr. of subsp. *astyanax*, and might well represent a reversion toward an ancestral type of coloration. No specimen before me. Habitat: Northern United States and Southern Canada.

Basilarchia arthemis rubrofasciata Barnes and McDunnough. (Fig. 2.)

Basilarchia arthemis subsp. *rubrofasciata* B. and McD., Can. Ent., vol. XLVII, p. 221, 1916.

Basilarchia arthemis race *rubrofasciata* B. and McD., Cont. Nat. Hist. Lepid. N. Amer., vol. III, pl. IX, fig. 7, 1916.

This subspecies can scarcely be distinguished from the preceding one in genitalic characters. I have a single male from Miniota, Manitoba, determined by Barnes and Benjamin. This specimen resembles subsp. *arthemis* very closely, but the submarginal series of red spots on the underside of wings run together and form a band. This is the northernmost race, which replaces subsp. *arthemis* in Canada toward the north. Habitat: Canada.

Basilarchia arthemis proserpina (Edwards). Fig. 3.

Limenitis proserpina Edw., Proc. Ent. Soc. Phil., vol. V, p. 148, 1865; Edw., Butt. N. Amer., vol. VIII, p. 127, 1869.

Limenitis arthemis f. *proserpina* Edw., Butt. N. Amer., vol. II, p. 203, pl. XXXVI, figs. 5, 6, 1889.

Basilarchia arthemis f. *proserpina* Scudder, Butt. East. U. S., vol. I, p. 289, pl. II, fig. 9, 1889.

In this subspecies, the downward curve of the dorsal margin of the valve is not so precipitous as in subsp. *arthemis*, although I doubt if this character is constant. Colorationally, it has the traces of the white band of subsp. *arthemis* faintly represented, usually including a short white streak on the costa of forewing. There are as a rule the usual series of red spots on the upper side of wings, but these may be entirely absent or present only in forewing.

Proserpina has long been considered as a form of *arthemis*, but Mr. Benjamin suggested (personal communication) that it is more natural to regard it as a race because of its constant occurrence in the Catskill Mountain region of New York. I tentatively subscribe to this view, especially on the basis of my genitalic finding. It may be noted, however, that even in the territory here indicated, *proserpina* is more apt to be an accompaniment of the typical form of subsp. *arthemis*, rather than itself being the principal representative of the species. Habitat: Catskill Mts., New York.

***Basilarchia arthemis albofasciata* (Newcomb).**

Limenitis ursula var. *albofasciata* Newc., Psyche, vol. XIV, p. 20, pl. III, fig. 6, 1907.

Basilarchia astyanax form *albofasciata* Barnes and McDunnough, Cont. Nat. Hist. Lepid. N. Amer., vol. III, p. 102, 1916.

I place this as a race intermediate between subsp. *arthemis* and subsp. *astyanax*, rather than as a form of the latter. It is often an accompaniment of *astyanax* in its northern half of the range, and without doubt they interbreed. From this *albofasciata* may be regarded as a color form of *astyanax*. On the other hand, I believe that further north of the *astyanax*-zone, there are territories where *albofasciata* occurs as the principal type of the species *arthemis*. For example, at Ithaca, N. Y., I have not seen a single specimen of *astyanax*, in spite of the fair number in which *albofasciata* occurs there. Some of the Ithaca specimens are small, simulating subsp. *arthemis*, but these small specimens are usually narrow-banded. There is no doubt that *albofasciata* merges into *arthemis* in its southern range, as the former run into *astyanax* in its northern territory. It may be said that *albofasciata* is an intermediate race, occupying the intermediate territory, and showing the markings of subsp. *arthemis* and the size of subsp. *astyanax* combined. The white band is usually narrower than in subsp. *arthemis*, but in some specimens it may be as wide,

or even wider. The red spots on the upper side of wings may be totally absent. Genitally, no difference has been found between this and subsp. *arthemis*.

Aberr. **benjamini**, ab. nov.

Upperside: a white bar on the costal margin of forewing, and a series of white spots extending from the middle of the fifth interspace down to the hind margin near the hind angle; a series of white macules also in hindwing, following internally the submarginal series of red spots. The position of these white spots suggests that they are the remains of the external portion of the usual white band. The white band is better preserved on the underside and it appears more as in the typical *albofasciata*, though considerably narrower and ill-defined on its inner border. Other markings are as in the typical form of subsp. *arthemis*.

Holotype: ♀, Massachusetts. Type in the Barnes Collection.

This aberration may be of interest as a connecting link between subsp. *albofasciata* and subsp. *astyanax*. It is very much like the specimen shown in Holland's Butterfly Book erroneously as form *proserpina*, with which it may be confused by collectors. *Proserpina*, however, is a much smaller butterfly, and has the white markings a good deal more reduced. Habitat: Central and Southern New York; Northern Pennsylvania; Massachusetts; Connecticut.

Basilarchia arthemis astyanax (Fabricius). (Fig. 4.)

Papilio astyanax Fab., Syst. Ent., p. 447, 1775.

Basilarchia astyanax Scudder, Butt. East. U. S., vol. I, p. 280, pl. II, fig. 8, 1889; Holland, Butt. Book, p. 183, pl. XXII, fig. 1, 1898.

Papilio ephestion Stoll, Suppl. Cramer Pap. Exot., p. 121, pl. XXV, fig. 1, 1790.

Papilio ursula Fab., Ent. Syst., vol. III, p. 82, 1793.

Callianira ephestiaena Hübn., Verz. bek. Schmett., p. 38, 1818.

In this subspecies, the downward curve of the dorsal margin of valve is gradual, and thus differs slightly from subsp. *arthemis*.

The larvae and pupae of *B. arthemis arthemis* and *B. arthemis astyanax* are said to be slightly different by Scudder (*l. c.*, p. 280 and 294) *et al.* According to Mr. F. E. Watson (personal communication), the chief larval differences are in the long tubercle,

which in *arthemis* is conspicuously clubbed and short, with short and conical spiny warts, while in *astyanax* it is not clubbed, with slender spiny warts. It is not known whether these differences are constant and show no intergradations. *A priori*, it is rather to be expected that the larva of typical *arthemis* and that of typical *astyanax* should differ from each other somewhat, for these two are slightly different structurally in the adult stage.

My reason for considering *astyanax* as a subspecies of *arthemis*, in spite of the larval differences, is as follows: Of all the so-called species of the genus *Basilarchia*, *arthemis* and *astyanax* are the only ones that show no clean-cut genitallic differences, the difference being very gradual and intergrading. Again, these are the only "species" that show intermediate forms regularly. The degree of isolation, both morphological and biological, between *arthemis* and *astyanax* is very much smaller than that between any other two species of the genus. Therefore to give a specific status to *astyanax* and to arrange it in juxtaposition with other much more sharply differentiated species is to commit an apparent taxonomic error.

The classical work of Field (*Psyche*, vol. XXI, p. 116, 1914) has already proved the great intimacy of phylogenetic relationship between *arthemis* and *astyanax* by producing experimental hybrids between them. Mr. Engelhardt, moreover, kindly informed me of the interesting experience of Mr. Doll, who has obtained in breeding *astyanax* in Brooklyn, N. Y., series of forms clearly indicating a close relationship to *arthemis*, including those that can not be distinguished from specimens of true *arthemis* from northern territories. Biological evidences like these outweigh any purely morphological facts in establishing the real closeness of the blood relationship, and they can only be explained under the theory that we are here dealing with forms that have segregated so recently that they have not yet become stable, or, in other words, have not become separate species.

The regular occurrence of intermediate forms between the typical form of subsp. *arthemis* and of subsp. *astyanax* has already been referred to. I have dealt with these intergradations in this paper as follows:

Subsp. *arthemis*: small in size, with a broad white band, and a series of red spots on the upperside of both wings.

Subsp. *proserpina*: size similar to *arthemis*, with faint traces of parts of the white band, and usually with red spots on the upperside of both wings.

Subsp. *albofasciata*: larger in size, usually with slightly narrower white band than subsp. *arthemis*; with or without the red spots. Aberr. *benjamini*: with the white band broken up into a series of white spots; size similar to typical *albofasciata*.

Form *atlantis*: the white band completely disappeared, but with a series of red spots on the upper side of hindwing.

Subsp. *astyanax*: The white band as well as the red spots of hindwing totally absent.

It may be seen from the above that the series of the connecting links between the two subspecies is completely established.

Forms included in subsp. *astyanax* are as follows:

Form **viridis** (Strecker).

Limenitis ephestion var. *viridis* Stkr., Syst. Cat. N. Amer. Lepid., p. 1444, 1878.

This is a common form in which the usual bluish markings are replaced by greenish.

Form **atlantis** Nakahara.

Basilarchia astyanax ab. *atlantis* Nakahara, Ent. News, vol. XXXIV, p. 10, 1923.

In this form a complete series of red spots is shown on the upperside of hindwing. It thus resembles certain forms of subsp. *proserpina*, but the size is larger, and there is no trace of the white band. The holotype of this aberration has been presented to the Barnes Collection. Since then I have examined another specimen from Long Island.

Aberr. **rubidus** (Strecker).

Limenitis ephestion ab. *rubidus* Stkr., Syst. N. Amer. Lepid., p. 1444, 1878.

This form is apparently intermediate between *B. arthemis astyanax* and *B. archippus archippus* in the coloration. There is no specimen before me.

Aberr. **cerulea** (Ehrmann).

Limenitis ursula var. *cerulea* Ehrm., Can. Ent., vol. XXXIII, p. 348, 1900.

This aberration is unknown to me. Described as having large bluish spots on upperside of wings similar to the white spots of *arthemis*.

Form *inornata*, forma nov.

Differs from the typical *astyanax* by the total absence of the red spots on the upperside of forewing, thus resembling subsp. *arizonensis* Edw.; the inner series of the submarginal lunules of hind wing larger than, and not whitish as in *arizonensis*; the veins crossing the postdiscal macular band not so broadly marked with black as in the subspecies; the red spots on the underside somewhat brighter; also, the shape of wings is that of *astyanax*.

Holotype: ♂, Glendale, L. I., N. Y.; Allotype: ♀; Paratopotype: ♂; Paratypes: ♂, Elmhurst, L. I., 2 ♂'s, Richmond Hill, L. I., ♂, Flushing, L. I., ♀, Aqueduct, L. I. Three paratypes (Elmhurst, Richmond Hill, and Flushing) in the collection of the writer. All other types in the Barnes Collection.

It should be mentioned that two of the paratypes (Flushing and Aqueduct) are marked with greenish as in form *viridis*, while all the other types are of the ordinary blue form. It is my intention to include under the name of *inornata*, specimens that show no red spot on the upper side of fore and hind wings, regardless of whether it is a blue or green form.

This new form may be of interest as a connecting link between subsp. *astyanax* and *arizonensis*.

Habitat: Eastern United States to Nebraska.

***Basilarchia arthemis arizonensis* (Edwards). Fig. 5.**

Limenitis ursula var. *arizonensis* Edw., Pap., vol. II, p. 22, 1882.

In this subspecies the downward curve of the dorsal margin of the valve is very slight. Apparently a common butterfly in Southern Arizona. I have a large series of specimens determined by Barnes and Benjamin, sent to me from the Barnes Collection. Habitat: Southern Arizona.

***Basilarchia weidemeyerii weidemeyerii* (Edwards). (Fig. 6).**

Limenitis weidemeyerii Edw., Proc. Acad. Nat. Sci. Phil., p. 162, 1861; Edw., Butt. N. Amer., vol. I, p. 129, pl. XLII, 1869; Wright, Butt. West Coast, p. 179, pl. XXIII, fig. 237, 1905.

Basilarchia weidemeyerii Holland, Butt. Book, p. 185, pl. XXII, fig. 6, 1898.

The valve is very lateral, and the distal portion of it is exceedingly broad with full and well rounded apex. Several short spiny projections are arranged in a somewhat straight line on the apical margin. Habitat: Colorado, Utah.

***Basilarchia weidemeyerii nevadae* Barnes et Benjamin.**

Basilarchia weidemeyerii race *nevadae* B. et B., Cont. Nat. Hist. Lepid. N. Amer., vol. V, p. 99, 1924.

One paratype, from Charlestown Mts., Southern Nevada, and another specimen, from Las Vegas, Nev., have been sent to me from the Barnes Collection. These are as narrowly banded as the following subspecies, *B. sinefascia* f. *angustifascia*, but the red and orange red spots on the underside of wings are all dull brown. This race cannot be distinguished by genitalic characters. Habitat: Charlestown Mts., Clark Co., Southern Nevada.

***Basilarchia weidemeyerii sinefascia* (Edwards).**

Limenitis weidemeyerii ab. *sinefascia* Edw., Pap., vol. II, p. 22, 1882.

Basilarchia weidemeyerii sinefascia Barnes and Benjamin, Cont. Nat. Hist. Lepid. N. Amer., vol. V, p. 99, 1924.

Sinefascia is an aberration of the Arizona race of *weidemeyerii*, which has been named *angustifascia* by Barnes and McDunnough. In order to comply with the International Rules, Barnes and Benjamin (*loc. cit.*) list the Arizona race as *B. weidemeyerii sinefascia*, distinguishing the normal form of the race as *B. weidemeyerii sinefascia* from normal *angustifascia* B. et McD.

Form *angustifascia* Barnes et McDunnough.

Basilarchia weidemeyerii race *angustifascia* B. and McD., Can. Ent., vol. XLIV, p. 163, 1912.

This subspecies does not differ genitally from the two preceding subspecies. I have a single specimen from the White Mts., Arizona (topotypical), determined by Barnes and Benjamin. Habitat: Arizona.

***Basilarchia lorquini lorquini* (Boisduval). (Fig. 7.)**

Limenitis lorquini Bois., Ann. Soc. Ent. France, vol. X, p. 301, 1852; Edwards, Butt. N. Amer., vol. I, p. 131, pl. XLIII, 1870.

The valve ends in a slender sharply pointed projection, with an additional small pointed projection dorsad the base of the conspicuous main one.

This subspecies was originally described from "California," and four specimens of the type series of Boisduval are now in the collection of M. Charles Oberthür. Through the kindness of M. Oberthür, a lot of specimens from different parts of California have been compared with these types. M. Oberthür returned to

me two specimens as agreeing best with the types, and these turned out to be southern California specimens. The two specimens compared with the types are now in the Barnes Collection.

In specimens from Middle California northward, through the mountainous parts of California and of Nevada, the white band across the wings is narrow; on the underside of hindwing, the entire anal area is whitish, and the whitish spots near the base of the wing are very distinct. These may be allowed to stand, at least for the present, as intermediate forms between subsp. *lorquini* and subsp. *burrisoni*. If the northern California and Nevada form should be established as a race, it would become necessary to apply the following aberrational name to that race.

Aberr. *eavesii* (Edwards).

Limenitis lorquini var. *eavesii* Edw., Pac. Coast Lepid., p. 9, 1877.

In this aberration, there is a postmedian series of fulvous spots on the upperside of hindwing. I have two specimens that exhibit this character: one from Plumas Co. and the other from Warner Mts., Modoc Co., of California. With the exception of the fulvous spots just mentioned, they agree well with the common form of northern California, with narrow white band. Habitat: California; Nevada; Oregon.

***Basilarchia lorquini burrisoni* (Maynard).**

Limenitis lorquini form *burrisoni* Mayn., Man. N. Amer. Butt., p. 102, 1891.

Basilarchia lorquini race *burrisoni* Barnes and McDunnough, Cont. Nat. Hist. Lepid. N. Amer., vol. III, p. 102, 1916.

There is nothing characteristic about the genitalia of this subspecies. This is the northern race with the greatly reduced apical fulvous patch, and with very dark underside. Habitat: British Columbia, including Vancouver Island; Idaho; Washington; Montana.

***Basilarchia archippus archippus* (Cramer). (Fig. 8).**

Papilio archippus Cram., Pap. Exot., vol. I, p. 24, pl. XVI, fig. A, 1775.

Basilarchia archippus Scudder, Butt. East. U. S., vol. I, p. 267, pl. I, fig. 5, 1889.

Nymphalis disippe Godart, Enc. Method., vol. IX, p. 393, 1823.

Basilarchia disippus Holland, Butt. Book, p. 185, pl. VII, fig. 4, 1898.

Papilio misippus Fabricius, Syst. Ent., p. 481, 1775 (nec Linneus).

The end of the valve produced into a strongly curved hook, with one or two small projections and a series of some four or five projections of varying lengths ventrad and dorsad, respectively, the base of the large prolongation.

B. archippus and *B. obsoleta* are genitally rather markedly different from other *Basilarchias*. Their peculiar hook-like structure on the valve and the dilated uncus previously referred to are quite striking. On the other hand, there are some reasons to believe that at least *archippus* and *arthemis* arose from a common *Basilarchia* ancestor in a not very long past. An aberrant form of *B. arthemis astyanax* known as ab. *rubidus*, for example, is to all appearances intermediate between *archippus* and *astyanax*. Mr. Benjamin, after examining two specimens of this interesting aberrant form, concludes that it is possibly an expression of a tendency to reversion toward an ancestral form, which he considers may be something not dissimilar to *archippus*. Because of the apparent intermediate coloration, an aberrant form like this has been considered as a hybrid between *archippus* and *astyanax* by some writers, and as a matter of fact an *archippus* \times *astyanax* hybrid, not unlike the form in question has been obtained artificially by Field (Psyche, vol. XI, p. 4; vol. XVII, p. 87; vol. XXI, p. 116).

However, such an aberration, or hybrid, is of very rare occurrence, and it is safe to say that intermediate forms are not produced in nature as a rule between *archippus* and *astyanax*. It is rational, then, to believe that *archippus*, with its characteristic genitalic structures, is a distinct species.

The larva of *B. archippus* is very close to that of *B. arthemis astyanax*, but according to Mr. Watson, it has the long tubercles much more thickly covered with long conical spiny warts.

Aberr. *pseudodorippus* (Strecker).

Limenitis misippus ab. *pseudodorippus* Stkr., Syst. Cat. Lepid. N. Amer., p. 143, 1878.

I have no specimen before me. Mr. Benjamin examined the female type from Holyoke, Massachusetts, listed by Strecker, and remarked that it is "well described by Strecker except that the

mesial black band of the hind wing is not absolutely missing, but is faintly indicated" (personal communication).

Aberr. *lanthanis* Cook et Watson.

Basilarchia archippus var. *lanthanis* Cook and Watson, Can. Ent., vol. XLI, p. 77, pl. V, 1909.

A single male specimen, apparently referable to this aberration, has been collected by the writer at Ithaca, N. Y., on August 27, 1923. In this specimen the postdiscal black belt of the hind wing is not completely gone but is represented by a very faint trace of it.

Aberr. *advena* (Ellsworth).

Limenitis archippus var. *advena* Ellsw., The Lepid., vol. II, p. 22, 1918.

Basilarchia misippus ab. *cayuga* Nakahara, Ent. News, vol. XXXIV, p. 10, 1923.

Basilarchia archippus ab. *advena* Barnes and Benjamin, The Lepid., p. 29, 1923.

The holotype of *cayuga* has been deposited in the Barnes Collection. Barnes and Benjamin (*loc. cit.*) compared it with the type of *advena* and noted a close agreement between them. Habitat: United States: Nova Scotia to British Columbia.

***Basilarchia archippus floridensis* (Strecker).** (Fig. 9.)

Limenitis misippus var. *floridensis* Stkr., Syst. Cat. Lepid. N. Amer., p. 143, 1878.

Limenitis eros Edwards, Can. Ent., vol. XII, p. 246.

This subspecies has the large hook-like prolongation as *B. archippus archippus*, but has none of the small spiny projections found in the latter subspecies.

Mr. Benjamin, who has recently examined Strecker's types has kindly informed me that "the type of *floridensis* is a little paler than the average conception of the race; *nig* is a darker specimen of the same thing" (see below). "Edwards's figures of *eros* are somewhat intermediate, but a third name in this subspecies is of but little value, and we place it as *floridensis*, with which it agrees best."

Form ***nig*** (Strecker).

Limenitis misippus ab. *nig* Stkr., Syst. Cat. Lepid. N. Amer., p. 143, 1878.

Limenitis misippus var. *floridensis* ab. *nigricans* Stkr., Lepid. Rhop. Heter., Suppl., vol. III, p. 24, 1900.

An especially dark colored specimen, among others, has been received from Gainesville, Fla., through the kindness of Mr. D. M. Bates. This specimen shows a faint trace of white crescents on the inner border of the postdiscal black belt of hindwing, upperside. It is highly probable that in future an aberrant form similar to *advena* in subsp. *archippus* may be found in *floridensis*.

Aberr. *halli* Watson and Comstock.

Basilarchia floridensis ab. *halli* Wats. and Comst., Bull. Amer. Mus. Nat. Hist., vol. XLII, p. 449, 1920.

This is an aberration analogous to ab. *lanthanis* of the preceding subspecies. No specimen before me. Habitat: Florida, Georgia, Mississippi.

***Basilarchia obsoleta* (Edwards). (Fig. 10.)**

Limenitis eros var. *obsoleta* Edw., Pap., vol. II, p. 22, 1882.

Limenitis obsoleta Wright, Butt. West Coast, p. 180, pl. XXIII, fig. 239, 1905.

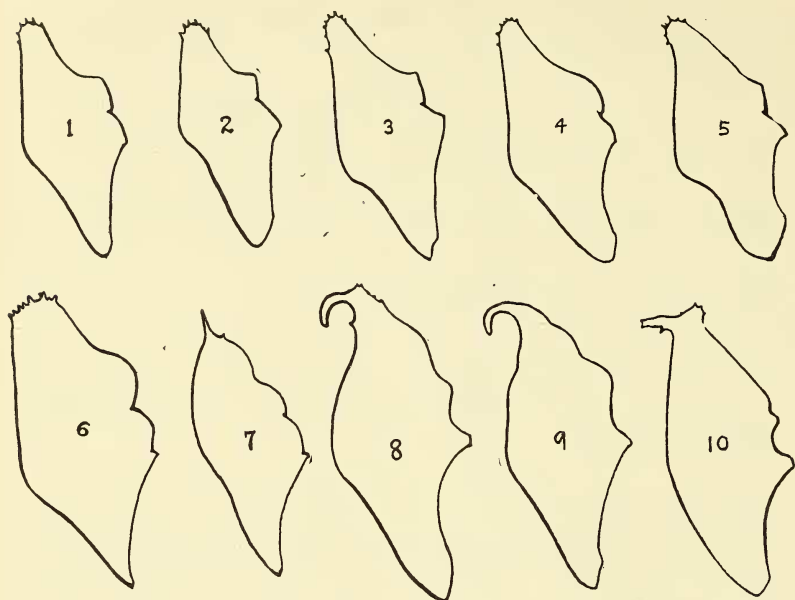
Limenitis hulsti Edw., Pap., vol. II, p. 46, 1882.

Basilarchia hulsti Holland, Butt. Book, p. 185, pl. VII, fig. 5, 1898.

In this synonymy I simply follow the literature.

The valve of this species is very similar to that of *B. archippus* but the large prolongation is shorter and is straight. There is an additional large, though short, projection dorsad the longer one, and the two together give the valve a bifurcate appearance. Habitat: Arizona; Utah.

Since writing the foregoing, through the kindness of Dr. W. T. M. Forbes, of Cornell University, Ithaca, N. Y., I have learned that *B. arthemis* subsp. *astyanax* has never been caught in the vicinity of Ithaca. *Proserpina*, however, occurs there, though very rarely, as evidenced by a few specimens in the Cornell University Collection. This shows that *albofasciata* can occur entirely separately from *astyanax*. On the other hand, the occurrence of *proserpina* in this locality suggests that the affinity between *albofasciata* and *arthemis* is a very close one, and in fact some of the smaller specimens from Ithaca might as well be called *arthemis*. All these facts tend to justify the proposed racial status of *albofasciata*, inasmuch as this form does occur in some localities as the principal type of the species.



EXPLANATION OF FIGURES.

All the figures represent lateral aspect of the valve of the male.

1. *Basilarchia arthemis arthemis* (Drury).
2. *Basilarchia arthemis rubrofasciata* Barnes et McDunnough.
3. *Basilarchia arthemis proserpina* (Edwards).
4. *Basilarchia arthemis astyanax* (Fabricius).
5. *Basilarchia arthemis arizonensis* (Edwards).
6. *Basilarchia weidemeyerii weidemeyerii* (Edwards).
7. *Basilarchia lorquini lorquini* (Boisduval).
8. *Basilarchia archippus archippus* (Cramer).
9. *Basilarchia archippus floridensis* (Strecker).
10. *Basilarchia obsoleta* (Edwards).